CoolGate Programmers Reference Manual (PRM)

CoolGate
CoolGate PRO

Interface Adapter MODBUS to VRV,VRF Air Conditioning Systems

Revision 0.28 12/5/2016

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1 Release Notes

Document revision 0.28 Monday, December 05, 2016

Type	Lowest Compatible FW version	
	CoolGate	CoolGate PRO
D	2.3.8	2.3.8
S	2.3.8	n.a.
T	2.3.8	n.a
M	2.3.9	2.5.7
F	2.6.4	n.a.
I(MH)	2.5.6	n.a.
H	2.5.3	2.7.1
L	2.6.3	n.a.
SM	2.9.4	n.a.

Document revision history

- 0.28

- CoolGate SM
- Conversion Table for Indoor Units 0-00..0-16, 1-00 .. 1-16

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- CoolGate D Temp Limits Register
- CoolGate D T1T2 closed bit

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- CoolGate 9000H PRO. Outdoor Unit Parameters table by System and Unit number.

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- CoolGate Internals. Connection Status.

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- CoolGate D VRV4 parameters

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- CoolGate 1000D PRO. Changed Precision and format (x10) of Outdoor, System, Indoor parameters

- 0.16

- CoolGate 1000D PRO. Changed Outdoor Units numbering

- 0.15

- CoolGate 9000H PRO. Added Y1 Outdoor Parameter

- 0.14

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- CoolGate 6000L
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- 0.7
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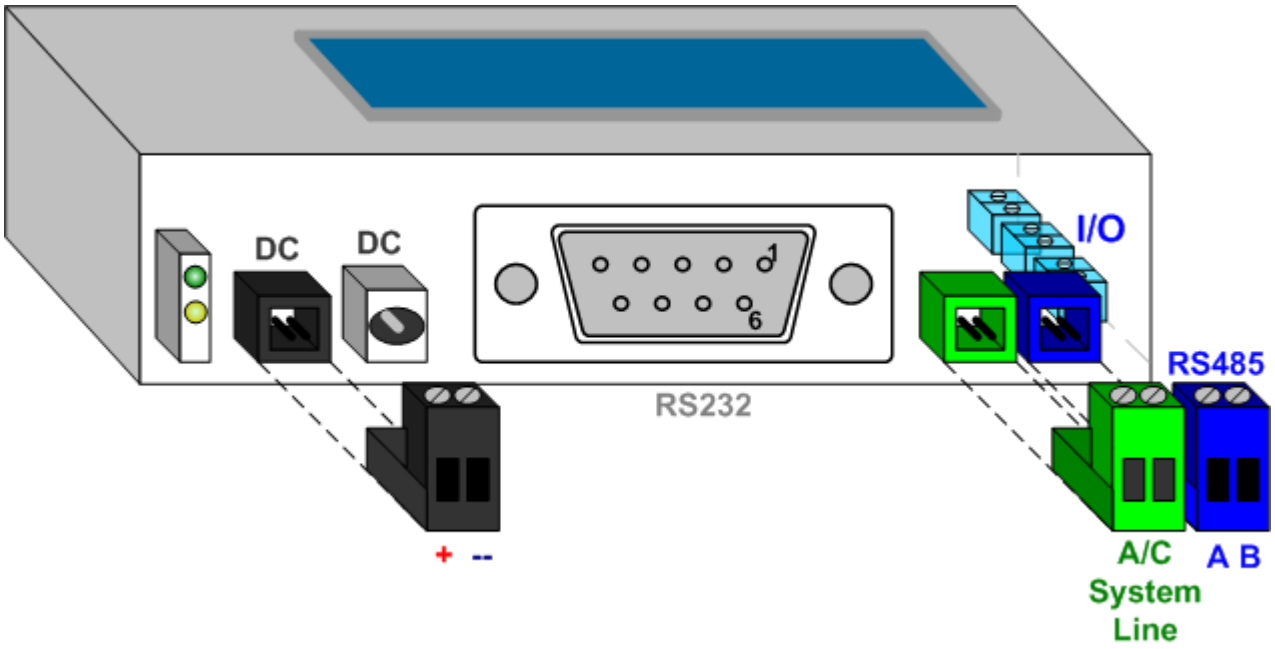
- Updated Failures Table
- 0.5
- Fixed failure translation table for CoolGate S type
- Added Modbus frame format definition
- 0.4
- Added failure code translation for CoolGate S and T types

2 CoolGate Layout



CoolGate supports Modbus RTU Transmission Mode with following byte format:

Baud Rate	9600
Start Bits	1
Data Bits	8
Parity	No
Stop Bits	1

Physical bytes transmission is done over “Two-Wire” electrical interface in accordance with EIA/TIA-485 standard via 485-A and 485-B terminals.

CoolGate Modbus address is reported on LCD. It can be changed via RS232 terminal with **set modaddr <ADDR>** command. For details see CoolMaster Programmers Reference Manual (PRM).

3 General Address Allocation

Coils,Registers, Address Range (hex)	Address Zone Size	Access To	Translation
0001 - 0800	128x16=0x800	Indoor Internal Parameters via AirNet 000-127	AirNet = (Address-1 >> 4)
0801 - 0900	16x16=0x100	Outdoor System Parameters 0-15	Outdoor System = (Address-1-0x800)>>4
0901 - 0B00	32x16=0x200	Outdoor Unit 0-15	Outdoor Unit = (Address-1-0x900)>>5
0B01 - 1000	0x500	Reserved	
1001 - F640	0xE640	Indoor Units 1-00 - 15-99	Indoor System = (Address-1-0x1000) >> 12 + 1 Indoor Unit = ((Address-1-0x1000) >> 4) & 0xFF
F641 - F700	0xC0	Reserved	
F701 - F800	0x100	Indoor Group Operations	
F801 - FF00	0x700	Reserved	
FF01 - FFFF	0x100	CoolGate Internals	

Backward conversion

Indoor System Parameters via AirNet 000-127	Address = AirNet << 4 +1
Outdoor System 0-15	Address = (OutdoorSystem << 4)+0x800 +1

4 Indoors Address Map

Indoor Unit	Base Address (hex)	Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
1-00	1001	1001	Present	1001	On/Off	1001	Mode	1001	Room Temperature
				1002	Filter Sign	1002	Fan Speed	1002	Failure Code
				1003	Terminals Status	1003	Set Temperature		
						1004	Set Temperature *100		
						1005	Bitfields (RO)		
						1006	Room Temperature (RO)		
						1007	Failure Code (RO)		
						1008	Room Temperature *100 (RO)		
						1009	Wall Controller (Thermostat) Lock (Prohibit) Bits		
						100A	Set Temperature Limits		

- Room Temperature (RO), Failure Code (RO) Holding registers are Read Only (RO) copy of the corresponding Input Registers

Indoor Unit	Base Address
1-01	1011
1-02	1021

...

2-00	2001

...

3-00	3001

...

4-00	4001

...

Details

Modbus Object	CoolGate Models	Version	Description
Set Temperature *100	D,SA	2.6.9	Provides option to read/write set point with 0.01 precision
Room Temperature *100 (RO)	D,SA	2.8.3	Provides option to read room temperature with 0.01 precision
Terminals status	D	2.9.4	For CoolGate D reflects T1-T2 terminals status: 0-Open, 1-Closed
Set Temperature Limits	D	2.9.4	High Limit range:16-31C, Low Limit range: 13-28C. Encoded as: MSB - High Limit, LSB - Low Limit.

			Register value = High Limit*256 + Low Limit. To Disable High or Low Limit set it's value to zero.

- Bitfields (RO) Holding Register format is:

MSB	Bit Number														LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
													Terminals Status	Filter Sign	On/ Off

- Lock (Prohibit) Bits format is:

MSB	Bit Number														LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
													Set Temperature	Mode	On/ Off

Bit set to "1" Locks corresponding operation of the Wall Controller. Supported in

- CoolGate S,T v2.8.4 or higher.
- CoolGate D v2.8.8 or higher

Indoor Unit number is same as in **stat** command.

CoolGate Type	Indoor Unit number	Modbus Map Base Address
D	1-00 .. 1-15 2-00 .. 2-15 3-00 .. 3-15 4-00 .. 4-15	0x1001 .. 0x10F1 0x2001 .. 0x20F1 0x3001 .. 0x30F1 0x4001 .. 0x40F1
S T For Version >= 2.5.3	1-01 .. 1-99 2-01 .. 2-99 ... 14-01 .. 14-99 Central Address 01-64	0x1011 .. 0x1631 0x2011 .. 0x2631 ... 0xE011 .. 0xE631 0xF011 .. 0xF401
M, I(MH)	001 .. 050 ...	0x1011 .. 0x1321 ...
L	000 .. 0FF	0x1001 .. 0x1FF1
F,H	1-01, .. ,2-01, ..	0x1011, .. 0x2011,..

Mode Encoding

Cool	0
Heat	1
Auto	2
Dry	3
Haux	4
Fan	5

Fan Speed Encoding

Low	0
Medium	1
High	2
Auto	3
Top	4

4.1 Address Conversion Tables

Conversion Table for Indoor Units 1-00..1-16, 2-00 .. 2-16

Paremeter	MODBUS Type	1-00 (000)		1-01 (001)		1-02 (002)		1-03 (003)		1-04 (004)		1-05 (005)		1-06 (006)		1-07 (007)	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
On/Off	Coil	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Filter	Coil	4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Mode	Holding Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
FanSpeed	Holding Register	4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Set Temperature	Holding Register	4099	1003	4115	1013	4131	1023	4147	1033	4163	1043	4179	1053	4195	1063	4211	1073
Room Temperature	Input Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Failure Code	Input Register	4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072

Paremeter	MODBUS Type	1-08 (008)		1-09 (009)		1-10 (010)		1-11 (011)		1-12 (012)		1-13 (013)		1-14 (014)		1-15 (015)	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
On/Off	Coil	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Filter	Coil	4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Mode	Holding Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
FanSpeed	Holding Register	4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Set Temperature	Holding Register	4227	1083	4243	1093	4259	10A3	4275	10B3	4291	10C3	4307	10D3	4323	10E3	4339	10F3
Room Temperature	Input Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Failure Code	Input Register	4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2

Paremeter	MODBUS Type	2-00		2-01		2-02		2-03		2-04		2-05		2-06		2-07	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
On/Off	Coil	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
Filter	Coil	8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072
Mode	Holding Register	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
FanSpeed	Holding Register	8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072
Set Temperature	Holding Register	8195	2003	8211	2013	8227	2023	8243	2033	8259	2043	8275	2053	8291	2063	8307	2073
Room Temperature	Input Register	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
Failure Code	Input Register	8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072

Paremeter	MODBUS Type	2-08		2-09		2-10		2-11		2-12		2-13		2-14		2-15	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
On/Off	Coil	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
Filter	Coil	8322	2082	8338	2092	8354	20A2	8370	20B2	8386	20C2	8402	20D2	8418	20E2	8434	20F2
Mode	Holding Register	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
FanSpeed	Holding Register	8322	2082	8338	2092	8354	20A2	8370	20B2	8386	20C2	8402	20D2	8418	20E2	8434	20F2
Set Temperature	Holding Register	8323	2083	8339	2093	8355	20A3	8371	20B3	8387	20C3	8403	20D3	8419	20E3	8435	20F3
Room Temperature	Input Register	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
Failure Code	Input Register	8322	2082	8338	2092	8354	20A2	8370	20B2	8386	20C2	8402	20D2	8418	20E2	8434	20F2

Conversion Table for Indoor Units 000..01F

Paremeter	MODBUS Type	000		001		002		003		004		005		006		007	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
On/Off	Coil	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Filter		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Mode	Holding Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
FanSpeed		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Set Temperature		4099	1003	4115	1013	4131	1023	4147	1033	4163	1043	4179	1053	4195	1063	4211	1073
Room Temperature	Input Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Failure Code		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072

Paremeter	MODBUS Type	008		009		00A		00B		00C		00D		00E		00F	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
On/Off	Coil	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Filter		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Mode	Holding Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
FanSpeed		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Set Temperature		4227	1083	4243	1093	4259	10A3	4275	10B3	4291	10C3	4307	10D3	4323	10E3	4339	10F3
Room Temperature	Input Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Failure Code		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2

Paremeter	MODBUS Type	010		011		012		013		014		015		016		017	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4353	1101	4369	1111	4385	1121	4401	1131	4417	1141	4433	1151	4449	1161	4465	1171
On/Off	Coil	4353	1101	4369	1111	4385	1121	4401	1131	4417	1141	4433	1151	4449	1161	4465	1171
Filter		4354	1102	4370	1112	4386	1122	4402	1132	4418	1142	4434	1152	4450	1162	4466	1172
Mode	Holding Register	4353	1101	4369	1111	4385	1121	4401	1131	4417	1141	4433	1151	4449	1161	4465	1171
FanSpeed		4354	1102	4370	1112	4386	1122	4402	1132	4418	1142	4434	1152	4450	1162	4466	1172
Set Temperature		4355	1103	4371	1113	4387	1123	4403	1133	4419	1143	4435	1153	4451	1163	4467	1173
Room Temperature	Input Register	4353	1101	4369	1111	4385	1121	4401	1131	4417	1141	4433	1151	4449	1161	4465	1171
Failure Code		4354	1102	4370	1112	4386	1122	4402	1132	4418	1142	4434	1152	4450	1162	4466	1172

Paremeter	MODBUS Type	018		019		01A		01B		01C		01D		01E		01F	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4481	1181	4497	1191	4513	11A1	4529	11B1	4545	11C1	4561	11D1	4577	11E1	4593	11F1
On/Off	Coil	4481	1181	4497	1191	4513	11A1	4529	11B1	4545	11C1	4561	11D1	4577	11E1	4593	11F1
Filter		4482	1182	4498	1192	4514	11A2	4530	11B2	4546	11C2	4562	11D2	4578	11E2	4594	11F2
Mode	Holding Register	4481	1181	4497	1191	4513	11A1	4529	11B1	4545	11C1	4561	11D1	4577	11E1	4593	11F1
FanSpeed		4482	1182	4498	1192	4514	11A2	4530	11B2	4546	11C2	4562	11D2	4578	11E2	4594	11F2
Set Temperature		4483	1183	4499	1193	4515	11A3	4531	11B3	4547	11C3	4563	11D3	4579	11E3	4595	11F3
Room Temperature	Input Register	4481	1181	4497	1191	4513	11A1	4529	11B1	4545	11C1	4561	11D1	4577	11E1	4593	11F1
Failure Code		4482	1182	4498	1192	4514	11A2	4530	11B2	4546	11C2	4562	11D2	4578	11E2	4594	11F2

Conversion Table for Indoor Units 0-00..0-16, 1-00 .. 1-16

Paremeter	MODBUS Type	0-00		0-01		0-02		0-03		0-04		0-05		0-06		0-07	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
On/Off	Coil	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Filter		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Mode	Holding Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
FanSpeed		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072
Set Temperature		4099	1003	4115	1013	4131	1023	4147	1033	4163	1043	4179	1053	4195	1063	4211	1073
Room Temperature	Input Register	4097	1001	4113	1011	4129	1021	4145	1031	4161	1041	4177	1051	4193	1061	4209	1071
Failure Code		4098	1002	4114	1012	4130	1022	4146	1032	4162	1042	4178	1052	4194	1062	4210	1072

Paremeter	MODBUS Type	0-08		0-09		0-10		0-11		0-12		0-13		0-14		0-15	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
On/Off	Coil	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Filter		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Mode	Holding Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
FanSpeed		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2
Set Temperature		4227	1083	4243	1093	4259	10A3	4275	10B3	4291	10C3	4307	10D3	4323	10E3	4339	10F3
Room Temperature	Input Register	4225	1081	4241	1091	4257	10A1	4273	10B1	4289	10C1	4305	10D1	4321	10E1	4337	10F1
Failure Code		4226	1082	4242	1092	4258	10A2	4274	10B2	4290	10C2	4306	10D2	4322	10E2	4338	10F2

Paremeter	MODBUS Type	1-00		1-01		1-02		1-03		1-04		1-05		1-06		1-07	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
On/Off	Coil	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
Filter		8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072
Mode	Holding Register	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
FanSpeed		8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072
Set Temperature		8195	2003	8211	2013	8227	2023	8243	2033	8259	2043	8275	2053	8291	2063	8307	2073
Room Temperature	Input Register	8193	2001	8209	2011	8225	2021	8241	2031	8257	2041	8273	2051	8289	2061	8305	2071
Failure Code		8194	2002	8210	2012	8226	2022	8242	2032	8258	2042	8274	2052	8290	2062	8306	2072

Paremeter	MODBUS Type	1-08		1-09		1-10		1-11		1-12		1-13		1-14		1-15	
		Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
Present	Input	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
On/Off	Coil	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
Filter		8322	2082	8338	2092	8354	20A2	8370	20B2	8386	20C2	8402	20D2	8418	20E2	8434	20F2
Mode	Holding Register	8321	2081	8337	2091	8353	20A1	8369	20B1	8385	20C1	8401	20D1	8417	20E1	8433	20F1
FanSpeed		8322	2082	8338	2092	8354	20A2	8370	20B2	8386	20C2	8402	20D2	8418	20E2	8434	20F2
Set Temperature		8323	2083	8339	2093	8355	20A3	8371	20B3	8387	20C3	8403	20D3	8419	20E3	8435	20F3

Conversion Table for CoolGate S|T Central address

Central Address	MODBUS Base Address	Central Address	MODBUS Base Address	Central Address	MODBUS Base Address	Central Address	MODBUS Base Address
01	0xF011	17	0xF111	33	0xF211	49	0xF311
02	0xF021	18	0xF121	34	0xF221	50	0xF321
03	0xF031	19	0xF131	35	0xF231	51	0xF331
04	0xF041	20	0xF141	36	0xF241	52	0xF341
05	0xF051	21	0xF151	37	0xF251	53	0xF351
06	0xF061	22	0xF161	38	0xF261	54	0xF361
07	0xF071	23	0xF171	39	0xF271	55	0xF371
08	0xF081	24	0xF181	40	0xF281	56	0xF381
09	0xF091	25	0xF191	41	0xF291	57	0xF391
10	0xF0A1	26	0xF1A1	42	0xF2A1	58	0xF3A1
11	0xF0B1	27	0xF1B1	43	0xF2B1	59	0xF3B1
12	0xF0C1	28	0xF1C1	44	0xF2C1	60	0xF3C1
13	0xF0D1	29	0xF1D1	45	0xF2D1	61	0xF3D1
14	0xF0E1	30	0xF1E1	46	0xF2E1	62	0xF3E1
15	0xF0F1	31	0xF1F1	47	0xF2F1	63	0xF3F1
16	0xF101	32	0xF201	48	0xF301	64	0xF401

5 Indoor Group Operations

Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
		F701	All On/Off (Write Only)			F701	Indoor Presents
						F702	
						F703	
						F704	
						F705	
						F706	
						F707	
						F708	
...							
						F720	

Indoor Presents

Indoor Present Input Registers F701..F720 are implemented to provide single Modbus transaction (Read Input Registers) access to Indoor Present information. Below is the relation table between register bits and Indoor Centralized Addresses for different AC Systems supported by CoolGate. Bit value of "1" indicates that corresponding Indoor Unit Present in AC System and is visible to CoolGate.

CoolGate D

Register	MSB	Bits														LSB
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
F701	1-15	1-14	1-13	1-12	1-11	1-10	1-09	1-08	1-07	1-06	1-05	1-04	1-03	1-02	1-01	1-00
F702	2-15	2-14	2-13	2-12	2-11	2-10	2-09	2-08	2-07	2-06	2-05	2-04	2-03	2-02	2-01	2-00
F703	3-15	3-14	3-13	3-12	3-11	3-10	3-09	3-08	3-07	3-06	3-05	3-04	3-03	3-02	3-01	3-00
F704	4-15	4-14	4-13	4-12	4-11	4-10	4-09	4-08	4-07	4-06	4-05	4-04	4-03	4-02	4-01	4-00
F705	5-15	5-14	5-13	5-12	5-11	5-10	5-09	5-08	5-07	5-06	5-05	5-04	5-03	5-02	5-01	5-00
F706	6-15	6-14	6-13	6-12	6-11	6-10	6-09	6-08	6-07	6-06	6-05	6-04	6-03	6-02	6-01	6-00
F707	7-15	7-14	7-13	7-12	7-11	7-10	7-09	7-08	7-07	7-06	7-05	7-04	7-03	7-02	7-01	7-00
F708	8-15	8-14	8-13	8-12	8-11	8-10	8-09	8-08	8-07	8-06	8-05	8-04	8-03	8-02	8-01	8-00

CoolGate D-PRO AirNet addresses

Register	MSB	Bits														LSB
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
F709	015	014	013	012	011	010	009	008	007	006	005	004	003	002	001	000
F710	031	030	029	028	027	026	025	024	023	022	021	020	019	018	017	016
F711	047	046	045	044	043	042	041	040	039	038	037	036	035	034	033	032
F712	063	062	061	060	059	058	057	056	055	054	053	052	051	050	049	048
F713	079	078	077	076	075	074	073	072	071	070	069	068	067	066	065	064
F714	095	094	093	092	091	090	089	088	087	086	085	084	083	082	081	080
F715	111	110	109	108	107	106	105	104	103	102	101	100	099	098	097	096
F716	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

CoolGate L

Register	MSB	Bits														LSB
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
F701	00F	00E	00D	00C	00B	00A	009	008	007	006	005	004	003	002	001	000
F702	01F	01E	01D	01C	01B	01A	019	018	017	016	015	014	013	012	011	010

F703	02F	02E	02D	02C	02B	02A	029	028	027	026	025	024	023	022	021	020
F704	03F	03E	03D	03C	03B	03A	039	038	037	036	035	034	033	032	031	030
F705	04F	04E	04D	04C	04B	04A	049	048	047	046	045	044	043	042	041	040
F706	05F	05E	05D	05C	05B	05A	059	058	057	056	055	054	053	052	051	050
F707	06F	06E	06D	06C	06B	06A	069	068	067	066	065	064	063	062	061	060
F708	07F	07E	07D	07C	07B	07A	079	078	077	076	075	074	073	072	071	070

```
Example:
Input Register F701 bit 2 corresponds to Indoor Unit 002
Input Register F702 bit 5 corresponds to Indoor Unit 015
```

CoolGate H

Register	MSB	Bits														LSB
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
F701	1-16	1-15	1-14	1-13	1-12	1-11	1-10	1-09	1-08	1-07	1-06	1-05	1-04	1-03	1-02	1-01
F702	1-32	1-31	1-30	1-29	1-28	1-27	1-26	1-25	1-24	1-23	1-22	1-21	1-20	1-19	1-18	1-17
F703	1-48	1-47	1-46	1-45	1-44	1-43	1-42	1-41	1-40	1-39	1-38	1-37	1-36	1-35	1-34	1-33
F704	1-64	1-63	1-62	1-61	1-60	1-59	1-58	1-57	1-56	1-55	1-54	1-53	1-52	1-51	1-50	1-49
F705	2-16	2-15	2-14	2-13	2-12	2-11	2-10	2-09	2-08	2-07	2-06	2-05	2-04	2-03	2-02	2-01
F706	2-32	2-31	2-30	2-29	2-28	2-27	2-26	2-25	2-24	2-23	2-22	2-21	2-20	2-19	2-18	2-17
F707	2-48	2-47	2-46	2-45	2-44	2-43	2-42	2-41	2-40	2-39	2-38	2-37	2-36	2-35	2-34	2-33
F708	2-64	2-63	2-62	2-61	2-60	2-59	2-58	2-57	2-56	2-55	2-54	2-53	2-52	2-51	2-50	2-49
F709	3-16	3-15	3-14	3-13	3-12	3-11	3-10	3-09	3-08	3-07	3-06	3-05	3-04	3-03	3-02	3-01
F70A	3-32	3-31	3-30	3-29	3-28	3-27	3-26	3-25	3-24	3-23	3-22	3-21	3-20	3-19	3-18	3-17
F70B	3-48	3-47	3-46	3-45	3-44	3-43	3-42	3-41	3-40	3-39	3-38	3-37	3-36	3-35	3-34	3-33
F70C	3-64	3-63	3-62	3-61	3-60	3-59	3-58	3-57	3-56	3-55	3-54	3-53	3-52	3-51	3-50	3-49
F70D	4-16	4-15	4-14	4-13	4-12	4-11	4-10	4-09	4-08	4-07	4-06	4-05	4-04	4-03	4-02	4-01
F70E	4-32	4-31	4-30	4-29	4-28	4-27	4-26	4-25	4-24	4-23	4-22	4-21	4-20	4-19	4-18	4-17
F70F	4-48	4-47	4-46	4-45	4-44	4-43	4-42	4-41	4-40	4-39	4-38	4-37	4-36	4-35	4-34	4-33
F710	4-64	4-63	4-62	4-61	4-60	4-59	4-58	4-57	4-56	4-55	4-54	4-53	4-52	4-51	4-50	4-49
F711	5-16	5-15	5-14	5-13	5-12	5-11	5-10	5-09	5-08	5-07	5-06	5-05	5-04	5-03	5-02	5-01
F712	5-32	5-31	5-30	5-29	5-28	5-27	5-26	5-25	5-24	5-23	5-22	5-21	5-20	5-19	5-18	5-17
F713	5-48	5-47	5-46	5-45	5-44	5-43	5-42	5-41	5-40	5-39	5-38	5-37	5-36	5-35	5-34	5-33
F714	5-64	5-63	5-62	5-61	5-60	5-59	5-58	5-57	5-56	5-55	5-54	5-53	5-52	5-51	5-50	5-49
F715	6-16	6-15	6-14	6-13	6-12	6-11	6-10	6-09	6-08	6-07	6-06	6-05	6-04	6-03	6-02	6-01
F716	6-32	6-31	6-30	6-29	6-28	6-27	6-26	6-25	6-24	6-23	6-22	6-21	6-20	6-19	6-18	6-17
F717	6-48	6-47	6-46	6-45	6-44	6-43	6-42	6-41	6-40	6-39	6-38	6-37	6-36	6-35	6-34	6-33
F718	6-64	6-63	6-62	6-61	6-60	6-59	6-58	6-57	6-56	6-55	6-54	6-53	6-52	6-51	6-50	6-49
F719	7-16	7-15	7-14	7-13	7-12	7-11	7-10	7-09	7-08	7-07	7-06	7-05	7-04	7-03	7-02	7-01
F71A	7-32	7-31	7-30	7-29	7-28	7-27	7-26	7-25	7-24	7-23	7-22	7-21	7-20	7-19	7-18	7-17
F71B	7-48	7-47	7-46	7-45	7-44	7-43	7-42	7-41	7-40	7-39	7-38	7-37	7-36	7-35	7-34	7-33
F71C	7-64	7-63	7-62	7-61	7-60	7-59	7-58	7-57	7-56	7-55	7-54	7-53	7-52	7-51	7-50	7-49
F71D	8-16	8-15	8-14	8-13	8-12	8-11	8-10	8-09	8-08	8-07	8-06	8-05	8-04	8-03	8-02	8-01
F71E	8-32	8-31	8-30	8-29	8-28	8-27	8-26	8-25	8-24	8-23	8-22	8-21	8-20	8-19	8-18	8-17
F71F	8-48	8-47	8-46	8-45	8-44	8-43	8-42	8-41	8-40	8-39	8-38	8-37	8-36	8-35	8-34	8-33
F720	8-64	8-63	8-62	8-61	8-60	8-59	8-58	8-57	8-56	8-55	8-54	8-53	8-52	8-51	8-50	8-49

COMPATIBILITY

CoolGate D	N.A.
CoolGate S	N.A.
CoolGate T	N.A.

CoolGate M	N.A.
CoolGate L	v2.8.2
CoolGate F	N.A.
CoolGate I	N.A.
CoolGate H	v2.9.1
CoolGate G	N.A.

6 Indoor Internal Parameters

Access to Indoor internal parameters available in CoolGate PRO only.

6.1 CoolGate D

To access indoor internal parameters in CoolGate D type Indoor units must be assigned AirNet address. AirNet address range is 000-127

AirNet Address	Base Address (hex)	Input Registers (hex)	
000	0001	0001	Suction Temperature **x10**
		0002	Liquid Pipe Temperature **x10**
		0003	Gas Pipe Temperature **x10**
		0004	EV Opening
		0005	Failure Code
		0006	Set Temperature
		0007	Indoor ON_OFF Bitfields
001	011		
002	021		
...			
127	07F1		

- Indoor ON_OFF Bitfields Register Format:

MSB	Bit Number														LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
														Thermostat_ ON	Operation/ Stop

Supported in CoolGate v2.8.4 or higher

6.2 CoolGate M

Unit Address	Base Address (hex)	Input Registers (hex)		
			F/P	PUHZ-RP4HA
001	0011	0011	Indoor Unit Type Code	
		0012	TH1*10	TH1
		0013	TH2*10	TH2
		0014	TH3*10	TH3
		0015		TH4
		0016	SH*10	TH5
		0017	SC*10	TH6
		0018	Li	TH7
		0019		TH8
		001A		Fan
		001B		Hz
		001C		SC*10
		001D		LevA
		001E		LevB
002	0021			

003	0031

...

050	0321

Indoor Type Codes

Code (hex)	Indoor Type
80FF	F/P (VRV Indoor)
800F	F/P (VRV Indoor)
800C	PUHZ-RP4HA (Mr SLIM)

Note:
1. Parameter*10 means that value read from CoolGate should be divided by 10 to get real parameter value.
2. For understanding of the meaning of the parameter codes please refer to this document: Maintenance Tools for MN converter & G-50A -Advanced

6.3 CoolGate H

Base Address for Indoor Internal Parameters is the same as Indoor Base Address listed in Indoors Address Map (and Address Conversion Tables).

Unit Address	Base Address (hex)	Input Registers (hex)	
1-01	1011	1011	
		1012	
		1013	
		1014	
		1015	
		1016	
		1017	
		1018	
		1019	
		101A	iE - Expected V Opening (%)
		101B	TI - Liquid Pipe Temp
		101C	Tg - Gas Pipe Temp
		101D	Ti - Intake Air Temp
		101E	To - Discharge Air Temp
		101F	fd - Requested Frequency (Hz)
		1020	Tr - Remote Sensor Temperature
1-02	1021		
1-03	1031		

...

7 Outdoor Systems

Access to Outdoor system parameters available in CoolGate PRO only.

7.1 CoolGate D

Outdoor System	Base Address (hex)	Input Registers (hex)			CoolGate Version
0	0801	0801	System HP		Any Version
		0802	System Current in 0.1A units		
		0803	Evaporation Temperature **x10**		
		0804	Condensing Temperature **x10**		
		0805	System Failure		
		0806	System ON_OFF Bitfields		v2.8.4
			VRV3	**VRV4**	v2.8.6
		0807		Operation Control Mode	
		0808		I/U Thermostat ON Capacity **x10**	
		0809	System AirNet Address		v2.9.1
1	0811				
2	0821				
...	...				
15	08F1				

- System ON_OFF Bitfields Register Format:

MSB	Bit Number															LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
VRV4	VRV3								Startup Control	Defrost	Stand by ON	Therm ON	Venti lation	Heat ing	Cool ing

8 Outdoor Unit Parameters

Access to Outdoor Unit parameters available in CoolGate PRO only.

8.1 CoolGate D

Outdoor Unit	Base Address (hex)	Input Registers (hex)			Cool Gate Version
			VRV3	VRV4	
S0U1	0901	0901	Outdoor System N		VRV3 Any VRV4 v2.8.6
		0902	HP		
		0903	Ambient Temperature		
		0904	Suction Temperature	Inv1 Rotation Amnt	
		0905	Evaporation Temperature		
		0906	Condensing Temperature		
		0907	Inverter Revolution Speed	Inv2 Rotation Amnt	
		0908	EV Opening 1		
		0909	EV Opening 2		
		090A	CT1 (STD1)	Fan1 Rotation Amnt	
		090B	CT2 (STD2)	Fan2 Rotation Amnt	
		090C	Fan Step		
		090D	Coil Temperature	Comp1 Discharge Temp	VRV3 v2.8.4 VRV4 v2.8.6
		090E	Discharge Temperature (INV)	Comp2 Discharge Temp	
		090F	Discharge Temperature (STD1)	Comp Surface Temp	
		0910	Discharge Temperature (STD2)	Acc Inlet Temp	
		0911	Acc Entrance Temperature	R4T Exchange Temp / Heat Exchanger Temp	
		0912	Receiver Liquid Temperature	R7T Exchange Temp / Heat Exchanger Liquid Pipe Temp	
		0913	Inverter Temperature	SBC Exchange Liquid Temp	
		0914	Inverter Current	SBC Excahnge Gas Temp	
		0915	Inverter FAN Current	Inv1 Fin Temp	
		0916	VRV3 ON_OFF Bitfields	Inv2 Fin Temp	
		0917	EV Opening 3		v2.8.6
		0918	SBC Coil Exit Temp	Comp1 Current	
		0919		Comp2 Current	
		091A		Inverter FAN Primary Current	
		091B		VRV4 ON_OFF Bitfields	
		091C	AirNet Address		v2.9.1
S0U2	0921				
S0U3	0941				
S0U4	0961				
S1U1	0981				
S1U2	09A1				
S1U3	09C1				
S1U4	09E1				
S2U1	0A01				
S2U2	0A21				
S2U3	0A41				
S2U4	0A61				
S3U1	0A81				
S3U2	0AA1				
S3U3	0AC1				
S3U4	0AE1				

S0U1 means "System - 0 Outdoor Unit - 1". List of the currently detected Systems and Outdoor Units can be retried with 'ostat' command via RS232 terminal.
Parameters

- VRV3 Outdoor ON_OFF Bitfields Register Format:

MSB	Bit Number														LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
				Error State	Multi Oil	Restart Standby	Soft Start	Crank Case Heater (CH3)	Crank Case Heater (CH2)	Crank Case Heater (CH1)	Hot_Gas	Oil_return	Compressor3 (STD2)	Compressor2 (STD1)	Compressor1 (INV)

Supported in CoolGate v2.8.5 or higher

- VRV4 Outdoor ON_OFF Bitfields Register Format:

MSB	Bit Number														LSB
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
						Own Unit Error	4 Way Valve Heating	Oil Return 2	Acc Oil Return	Oil Return 1	4 Way Valve	Crank Case Heater (CH2)	Crank Case Heater (CH1)	INV2	INV1

Supported in CoolGate v2.8.6 or higher

8.2 CoolGate M

Outdoor Unit Address	Base Address (hex)	Input Registers (hex)		
			PUHY	PURY
051	0921	0921	Outdoor Unit Type Code	
		0922	TH1*10	
		0923	TH2*10	
		0924	TH3*10	
		0925	TH4*10	
		0926	TH5*10	
		0927	TH6*10	
		0928	TH7*10	
		0929	THHS*10	
		092A	THBox*10	
		092B	63HSI*10	
		092C	63LS*10	
		092D	Tc*10	
		092E	Te*10	
		092F	Vdc*10	
		0930	Iu*10	
		0931	Iw*10	
		0932	FAN	
		0933	Foc	
		0934	F(Hz)	
		0935		
		0936		
		0937		
		0938		
		0939		
		093A	SCo*10	
		093B	SCc*10	
		093C	SHb*10	
052	0941			
053	0961			

...

058	0A01

Outdoor Type Codes

Code (hex)	Outdoor Type
83A9	PUHY
83A2	PURY

Note:
1. Parameter*10 means that value read from CoolGate should be divided by 10 to get real parameter value.
2. For understanding of the meaning of the parameter codes please refer to this document: Maintenance Tools for MN converter & G-50A -Advanced

8.3 CoolGate H

Outdoor Unit	Base Address (hex)	Input Registers (hex)		Cool Gate Version
S0U0	0901	0901	Outdoor Type	v2.9.3
		0902	ROM No	
		0903	Td1 Inverter Comp1 Top Temperature	
		0904	Td2	
		0905	Td3	
		0906	Td4	
		0907	Td5	
		0908	Td6	
		0909	Td - Comp. Top Temperature	
		090A	Te1 Evaporating Temperature 1	
		090B	Te2	
		090C	Te3	
		090D	A1 Comp1 Current (A) *2	
		090E	A2	
		090F	A3	
		0910	A4	
		0911	A5	
		0912	A6	
		0913	oE1 Exp V1 Opening (%)	
		0914	oE2	
		0915	oE3	
		0916	A12 - Inv Comp1 2nd Current (A) *2	
		0917	Tfin - Inv Fin Temp	
		0918	Pd - High Pressure (MPa) *10	
		0919	Ps - Low Pressure (MPa) *10	
		091A	Fo - Air Flow Fan Tap	
		091B	H1 - Inverter Comp Frequency (Hz)	
		091C	H2 - Total Frequency (Hz)	
		091D	cc - Run Comp Quality	

		091E	Ta - Outdoor Temperature	
		091F	Y1 - Relays Status	
		0920		
S0U1	0921			
S0U2	0941			
S0U3	0961			
S1U0	0981			
S1U1	09A1			
S1U2	09C1			
S1U3	09E1			
S2U0	0A01			
S2U1	0A21			
S2U2	0A41			
S2U3	0A61			
S3U0	0A81			
S3U1	0AA1			
S3U2	0AC1			
S3U3	0AE1			

Outdoor Type Codes

Code (hex)	Indoor Type
0047	RAS-22FSNE
005F	RAS-16FSN1
00C8	RAS-AP160

Y1 Relay Status Bits

Bit	Mask	Definition
6	0040h	YFAN1 - FAN1 Relay

Note:
1. Parameter *2 means that value read from CoolGate should be divided by 2 to get real parameter value.
2. Parameter *10 means that value read from CoolGate should be divided by 10 to get real parameter value.
3. Parameter *100 means that value read from CoolGate should be divided by 100 to get real parameter value.

Parameter	Outdoor Number							
	S0U0	S0U1	S0U2	S0U3	S1U0	S1U1	S1U2	S1U3
	Input Register Address Hex and Dec							
Outdoor Type	0x0901 2305	0x0921 2337	0x0941 2369	0x0961 2401	0x0981 2433	0x09A1 2465	0x09C1 2497	0x09E1 2529
ROM No	0x0902 2306	0x0922 2338	0x0942 2370	0x0962 2402	0x0982 2434	0x09A2 2466	0x09C2 2498	0x09E2 2530
Td1	0x0903 2307	0x0923 2339	0x0943 2371	0x0963 2403	0x0983 2435	0x09A3 2467	0x09C3 2499	0x09E3 2531
Td2	0x0904 2308	0x0924 2340	0x0944 2372	0x0964 2404	0x0984 2436	0x09A4 2468	0x09C4 2500	0x09E4 2532
Td3	0x0905 2309	0x0925 2341	0x0945 2373	0x0965 2405	0x0985 2437	0x09A5 2469	0x09C5 2501	0x09E5 2533
Td4	0x0906 2310	0x0926 2342	0x0946 2374	0x0966 2406	0x0986 2438	0x09A6 2470	0x09C6 2502	0x09E6 2534
Td5	0x0907	0x0927	0x0947	0x0967	0x0987	0x09A7	0x09C7	0x09E7

	2311	2343	2375	2407	2439	2471	2503	2535
Td6	0x0908 2312	0x0928 2344	0x0948 2376	0x0968 2408	0x0988 2440	0x09A8 2472	0x09C8 2504	0x09E8 2536
Td	0x0909 2313	0x0929 2345	0x0949 2377	0x0969 2409	0x0989 2441	0x09A9 2473	0x09C9 2505	0x09E9 2537
Te1	0x090A 2314	0x092A 2346	0x094A 2378	0x096A 2410	0x098A 2442	0x09AA 2474	0x09CA 2506	0x09EA 2538
Te2	0x090B 2315	0x092B 2347	0x094B 2379	0x096B 2411	0x098B 2443	0x09AB 2475	0x09CB 2507	0x09EB 2539
Te3	0x090C 2316	0x092C 2348	0x094C 2380	0x096C 2412	0x098C 2444	0x09AC 2476	0x09CC 2508	0x09EC 2540
A1	0x090D 2317	0x092D 2349	0x094D 2381	0x096D 2413	0x098D 2445	0x09AD 2477	0x09CD 2509	0x09ED 2541
A2	0x090E 2318	0x092E 2350	0x094E 2382	0x096E 2414	0x098E 2446	0x09AE 2478	0x09CE 2510	0x09EE 2542
A3	0x090F 2319	0x092F 2351	0x094F 2383	0x096F 2415	0x098F 2447	0x09AF 2479	0x09CF 2511	0x09EF 2543
A4	0x0910 2320	0x0930 2352	0x0950 2384	0x0970 2416	0x0990 2448	0x09B0 2480	0x09D0 2512	0x09F0 2544
A5	0x0911 2321	0x0931 2353	0x0951 2385	0x0971 2417	0x0991 2449	0x09B1 2481	0x09D1 2513	0x09F1 2545
A6	0x0912 2322	0x0932 2354	0x0952 2386	0x0972 2418	0x0992 2450	0x09B2 2482	0x09D2 2514	0x09F2 2546
oE1	0x0913 2323	0x0933 2355	0x0953 2387	0x0973 2419	0x0993 2451	0x09B3 2483	0x09D3 2515	0x09F3 2547
oE2	0x0914 2324	0x0934 2356	0x0954 2388	0x0974 2420	0x0994 2452	0x09B4 2484	0x09D4 2516	0x09F4 2548
oE3	0x0915 2325	0x0935 2357	0x0955 2389	0x0975 2421	0x0995 2453	0x09B5 2485	0x09D5 2517	0x09F5 2549
A12	0x0916 2326	0x0936 2358	0x0956 2390	0x0976 2422	0x0996 2454	0x09B6 2486	0x09D6 2518	0x09F6 2550
Tfin	0x0917 2327	0x0937 2359	0x0957 2391	0x0977 2423	0x0997 2455	0x09B7 2487	0x09D7 2519	0x09F7 2551
Pd	0x0918 2328	0x0938 2360	0x0958 2392	0x0978 2424	0x0998 2456	0x09B8 2488	0x09D8 2520	0x09F8 2552
Ps	0x0919 2329	0x0939 2361	0x0959 2393	0x0979 2425	0x0999 2457	0x09B9 2489	0x09D9 2521	0x09F9 2553
Fo	0x091A 2330	0x093A 2362	0x095A 2394	0x097A 2426	0x099A 2458	0x09BA 2490	0x09DA 2522	0x09FA 2554
H1	0x091B 2331	0x093B 2363	0x095B 2395	0x097B 2427	0x099B 2459	0x09BB 2491	0x09DB 2523	0x09FB 2555
H2	0x091C 2332	0x093C 2364	0x095C 2396	0x097C 2428	0x099C 2460	0x09BC 2492	0x09DC 2524	0x09FC 2556
cc	0x091D 2333	0x093D 2365	0x095D 2397	0x097D 2429	0x099D 2461	0x09BD 2493	0x09DD 2525	0x09FD 2557
Ta	0x091E 2334	0x093E 2366	0x095E 2398	0x097E 2430	0x099E 2462	0x09BE 2494	0x09DE 2526	0x09FE 2558
Y1	0x091F 2335	0x093F 2367	0x095F 2399	0x097F 2431	0x099F 2463	0x09BF 2495	0x09DF 2527	0x09FF 2559

9 Special Devices

9.1 PAC-YG63, PAC-YG66

CoolGate 4000M v2.5.6 and higher supports PAC-YG66 - digital I/O extender and PAC-YG63 - analog I/O extender. Access to this devices available via Indoor Units address range. Below are examples for PAC-YG66/63 at centralized address 001.

- PAC-YG66

Indoor Unit	Base Address (hex)	Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
001	1011	1011	Present						
								1012	Failure Code
		1013	Input 1	1013	Output 1				
		1014	Input 2	1014	Output 2				
		1015	Input 3	1015	Output 3				
		1016	Input 4	1016	Output 4				
		1017	Input 5	1017	Output 5				
		1018	Input 6	1018	Output 6				

- PAC-YG63

Indoor Unit	Base Address (hex)	Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
001	1011	1011	Present						
								1012	Failure Code
								1013	**Analog Input 1 *10**
								1014	**Analog Input 2 *10**

The actual Analog Input value should be calculated as

```
Analog Input Value = Input Register Value / 10
```

For example if temperature sensor is connected to Analog Input 1 and corresponding Input Register is read as 275 the temperature is 275/10 = 27.5

9.2 VAM HRV

CoolGate D 2.5.8 and higher supports VAM HRV units. For VAM HRV units Mode and FAN Speed Holding Registers (see Indoors Address Map) have a different Encoding:

Mode Encoding

Auto	17 (0x11)
Bypass	18 (0x12)
Heat Exchange	19 (0x13)

Fan Speed Encoding

Low	16 (0x10)
High	17 (0x11)

FreshUp Low	18 (0x12)
FreshUp High	19 (0x13)

10 CoolGate Internals

Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
				FF01	CoolGate Version (RO)	FF01	HVAC Connection Status

Holding Registers:

- CoolGate Version (RO) keeps version as decimal number XYZ that should be interpreted as X.Y.Z. For example number 283 corresponds to version code 2.8.3. (Available in CoolGate Version 2.8.3 or higher).

Input Registers:

- HVAC Connection Status. (Available in only in CoolGate D Version 2.9.1 or higher)
  0x0000 - Properly connected
  0xFFFF - Disconnected from HVAC (In this situation CoolGate will return Modbus Exception 0x04: "Slave Device Failure" in attempt to access Indoor Internal, Outdoor System and Outdoor Unit parameters).

11 Failure Codes

Below is a translation table between failure code register value and failure code used by A/C manufacturer. For M,L,H,F,I model register value and failure code are the same and requires no translation.

- For CoolGate D type

000 (0x00) - 00	001 (0x01) - 01	002 (0x02) - 02	003 (0x03) - 03
004 (0x04) - 04	005 (0x05) - 05	006 (0x06) - 06	007 (0x07) - 07
008 (0x08) - 08	009 (0x09) - 09	010 (0x0A) - 0A	011 (0x0B) - 0H
012 (0x0C) - 0C	013 (0x0D) - 0J	014 (0x0E) - 0E	015 (0x0F) - 0F
016 (0x10) - A0	017 (0x11) - A1	018 (0x12) - A2	019 (0x13) - A3
020 (0x14) - A4	021 (0x15) - A5	022 (0x16) - A6	023 (0x17) - A7
024 (0x18) - A8	025 (0x19) - A9	026 (0x1A) - AA	027 (0x1B) - AH
028 (0x1C) - AC	029 (0x1D) - AJ	030 (0x1E) - AE	031 (0x1F) - AF
032 (0x20) - C0	033 (0x21) - C1	034 (0x22) - C2	035 (0x23) - C3
036 (0x24) - C4	037 (0x25) - C5	038 (0x26) - C6	039 (0x27) - C7
040 (0x28) - C8	041 (0x29) - C9	042 (0x2A) - CA	043 (0x2B) - CH
044 (0x2C) - CC	045 (0x2D) - CJ	046 (0x2E) - CE	047 (0x2F) - CF
048 (0x30) - E0	049 (0x31) - E1	050 (0x32) - E2	051 (0x33) - E3
052 (0x34) - E4	053 (0x35) - E5	054 (0x36) - E6	055 (0x37) - E7
056 (0x38) - E8	057 (0x39) - E9	058 (0x3A) - EA	059 (0x3B) - EH
060 (0x3C) - EC	061 (0x3D) - EJ	062 (0x3E) - EE	063 (0x3F) - EF
064 (0x40) - H0	065 (0x41) - H1	066 (0x42) - H2	067 (0x43) - H3
068 (0x44) - H4	069 (0x45) - H5	070 (0x46) - H6	071 (0x47) - H7
072 (0x48) - H8	073 (0x49) - H9	074 (0x4A) - HA	075 (0x4B) - HH
076 (0x4C) - HC	077 (0x4D) - HJ	078 (0x4E) - HE	079 (0x4F) - HF
080 (0x50) - F0	081 (0x51) - F1	082 (0x52) - F2	083 (0x53) - F3
084 (0x54) - F4	085 (0x55) - F5	086 (0x56) - F6	087 (0x57) - F7
088 (0x58) - F8	089 (0x59) - F9	090 (0x5A) - FA	091 (0x5B) - FH
092 (0x5C) - FC	093 (0x5D) - FJ	094 (0x5E) - FE	095 (0x5F) - FF
096 (0x60) - J0	097 (0x61) - J1	098 (0x62) - J2	099 (0x63) - J3
100 (0x64) - J4	101 (0x65) - J5	102 (0x66) - J6	103 (0x67) - J7
104 (0x68) - J8	105 (0x69) - J9	106 (0x6A) - JA	107 (0x6B) - JH
108 (0x6C) - JC	109 (0x6D) - JJ	110 (0x6E) - JE	111 (0x6F) - JF
112 (0x70) - L0	113 (0x71) - L1	114 (0x72) - L2	115 (0x73) - L3
116 (0x74) - L4	117 (0x75) - L5	118 (0x76) - L6	119 (0x77) - L7
120 (0x78) - L8	121 (0x79) - L9	122 (0x7A) - LA	123 (0x7B) - LH
124 (0x7C) - LC	125 (0x7D) - LJ	126 (0x7E) - LE	127 (0x7F) - LF
128 (0x80) - P0	129 (0x81) - P1	130 (0x82) - P2	131 (0x83) - P3
132 (0x84) - P4	133 (0x85) - P5	134 (0x86) - P6	135 (0x87) - P7
136 (0x88) - P8	137 (0x89) - P9	138 (0x8A) - PA	139 (0x8B) - PH
140 (0x8C) - PC	141 (0x8D) - PJ	142 (0x8E) - PE	143 (0x8F) - PF
144 (0x90) - U0	145 (0x91) - U1	146 (0x92) - U2	147 (0x93) - U3
148 (0x94) - U4	149 (0x95) - U5	150 (0x96) - U6	151 (0x97) - U7
152 (0x98) - U8	153 (0x99) - U9	154 (0x9A) - UA	155 (0x9B) - UH
156 (0x9C) - UC	157 (0x9D) - UJ	158 (0x9E) - UE	159 (0x9F) - UF
160 (0xA0) - M0	161 (0xA1) - M1	162 (0xA2) - M2	163 (0xA3) - M3
164 (0xA4) - M4	165 (0xA5) - M5	166 (0xA6) - M6	167 (0xA7) - M7
168 (0xA8) - M8	169 (0xA9) - M9	170 (0xAA) - MA	171 (0xAB) - MH
172 (0xAC) - MC	173 (0xAD) - MJ	174 (0xAE) - ME	175 (0xAF) - MF
176 (0xB0) - 30	177 (0xB1) - 31	178 (0xB2) - 32	179 (0xB3) - 33
180 (0xB4) - 34	181 (0xB5) - 35	182 (0xB6) - 36	183 (0xB7) - 37
184 (0xB8) - 38	185 (0xB9) - 39	186 (0xBA) - 3A	187 (0xBB) - 3H
188 (0xBC) - 3C	189 (0xBD) - 3J	190 (0xBE) - 3E	191 (0xBF) - 3F
192 (0xC0) - 40	193 (0xC1) - 41	194 (0xC2) - 42	195 (0xC3) - 43
196 (0xC4) - 44	197 (0xC5) - 45	198 (0xC6) - 46	199 (0xC7) - 47
200 (0xC8) - 48	201 (0xC9) - 49	202 (0xCA) - 4A	203 (0xCB) - 4H
204 (0xCC) - 4C	205 (0xCD) - 4J	206 (0xCE) - 4E	207 (0xCF) - 4F
208 (0xD0) - 50	209 (0xD1) - 51	210 (0xD2) - 52	211 (0xD3) - 53
212 (0xD4) - 54	213 (0xD5) - 55	214 (0xD6) - 56	215 (0xD7) - 57
216 (0xD8) - 58	217 (0xD9) - 59	218 (0xDA) - 5A	219 (0xDB) - 5H
220 (0xDC) - 5C	221 (0xDD) - 5J	222 (0xDE) - 5E	223 (0xDF) - 5F
224 (0xE0) - 60	225 (0xE1) - 61	226 (0xE2) - 62	227 (0xE3) - 63
228 (0xE4) - 64	229 (0xE5) - 65	230 (0xE6) - 66	231 (0xE7) - 67
232 (0xE8) - 68	233 (0xE9) - 69	234 (0xEA) - 6A	235 (0xEB) - 6H
236 (0xEC) - 6C	237 (0xED) - 6J	238 (0xEE) - 6E	239 (0xEF) - 6F
240 (0xF0) - ?0	241 (0xF1) - ?1	242 (0xF2) - ?2	243 (0xF3) - ?3
244 (0xF4) - ?4	245 (0xF5) - ?5	246 (0xF6) - ?6	247 (0xF7) - ?7
248 (0xF8) - ?8	249 (0xF9) - ?9	250 (0xFA) - ?A	251 (0xFB) - ?H
252 (0xFC) - ?C	253 (0xFD) - ?J	254 (0xFE) - ?E	255 (0xFF) - ?F

- For CoolGate S or T type

000 (0x00) - A00	001 (0x01) - A01	002 (0x02) - A02	003 (0x03) - A03
004 (0x04) - A04	005 (0x05) - A05	006 (0x06) - A06	007 (0x07) - A07
008 (0x08) - A08	009 (0x09) - A09	010 (0x0A) - A10	011 (0x0B) - A11
012 (0x0C) - A12	013 (0x0D) - A13	014 (0x0E) - A14	015 (0x0F) - A15
016 (0x10) - A16	017 (0x11) - A17	018 (0x12) - A18	019 (0x13) - A19
020 (0x14) - A20	021 (0x15) - A21	022 (0x16) - A22	023 (0x17) - A23
024 (0x18) - A24	025 (0x19) - A25	026 (0x1A) - A26	027 (0x1B) - A27
028 (0x1C) - A28	029 (0x1D) - A29	030 (0x1E) - A30	031 (0x1F) - A31
032 (0x20) - C00	033 (0x21) - C01	034 (0x22) - C02	035 (0x23) - C03
036 (0x24) - C04	037 (0x25) - C05	038 (0x26) - C06	039 (0x27) - C07
040 (0x28) - C08	041 (0x29) - C09	042 (0x2A) - C10	043 (0x2B) - C11
044 (0x2C) - C12	045 (0x2D) - C13	046 (0x2E) - C14	047 (0x2F) - C15
048 (0x30) - C16	049 (0x31) - C17	050 (0x32) - C18	051 (0x33) - C19
052 (0x34) - C20	053 (0x35) - C21	054 (0x36) - C22	055 (0x37) - C23
056 (0x38) - C24	057 (0x39) - C25	058 (0x3A) - C26	059 (0x3B) - C27
060 (0x3C) - C28	061 (0x3D) - C29	062 (0x3E) - C30	063 (0x3F) - C31
064 (0x40) - E00	065 (0x41) - E01	066 (0x42) - E02	067 (0x43) - E03
068 (0x44) - E04	069 (0x45) - E05	070 (0x46) - E06	071 (0x47) - E07
072 (0x48) - E08	073 (0x49) - E09	074 (0x4A) - E10	075 (0x4B) - E11
076 (0x4C) - E12	077 (0x4D) - E13	078 (0x4E) - E14	079 (0x4F) - E15
080 (0x50) - E16	081 (0x51) - E17	082 (0x52) - E18	083 (0x53) - E19
084 (0x54) - E20	085 (0x55) - E21	086 (0x56) - E22	087 (0x57) - E23
088 (0x58) - E24	089 (0x59) - E25	090 (0x5A) - E26	091 (0x5B) - E27
092 (0x5C) - E28	093 (0x5D) - E29	094 (0x5E) - E30	095 (0x5F) - E31
096 (0x60) - F00	097 (0x61) - F01	098 (0x62) - F02	099 (0x63) - F03
100 (0x64) - F04	101 (0x65) - F05	102 (0x66) - F06	103 (0x67) - F07
104 (0x68) - F08	105 (0x69) - F09	106 (0x6A) - F10	107 (0x6B) - F11
108 (0x6C) - F12	109 (0x6D) - F13	110 (0x6E) - F14	111 (0x6F) - F15
112 (0x70) - F16	113 (0x71) - F17	114 (0x72) - F18	115 (0x73) - F19
116 (0x74) - F20	117 (0x75) - F21	118 (0x76) - F22	119 (0x77) - F23
120 (0x78) - F24	121 (0x79) - F25	122 (0x7A) - F26	123 (0x7B) - F27
124 (0x7C) - F28	125 (0x7D) - F29	126 (0x7E) - F30	127 (0x7F) - F31
128 (0x80) - H00	129 (0x81) - H01	130 (0x82) - H02	131 (0x83) - H03
132 (0x84) - H04	133 (0x85) - H05	134 (0x86) - H06	135 (0x87) - H07
136 (0x88) - H08	137 (0x89) - H09	138 (0x8A) - H10	139 (0x8B) - H11
140 (0x8C) - H12	141 (0x8D) - H13	142 (0x8E) - H14	143 (0x8F) - H15
144 (0x90) - H16	145 (0x91) - H17	146 (0x92) - H18	147 (0x93) - H19
148 (0x94) - H20	149 (0x95) - H21	150 (0x96) - H22	151 (0x97) - H23
152 (0x98) - H24	153 (0x99) - H25	154 (0x9A) - H26	155 (0x9B) - H27
156 (0x9C) - H28	157 (0x9D) - H29	158 (0x9E) - H30	159 (0x9F) - H31
160 (0xA0) - J00	161 (0xA1) - J01	162 (0xA2) - J02	163 (0xA3) - J03
164 (0xA4) - J04	165 (0xA5) - J05	166 (0xA6) - J06	167 (0xA7) - J07
168 (0xA8) - J08	169 (0xA9) - J09	170 (0xAA) - J10	171 (0xAB) - J11
172 (0xAC) - J12	173 (0xAD) - J13	174 (0xAE) - J14	175 (0xAF) - J15
176 (0xB0) - J16	177 (0xB1) - J17	178 (0xB2) - J18	179 (0xB3) - J19
180 (0xB4) - J20	181 (0xB5) - J21	182 (0xB6) - J22	183 (0xB7) - J23
184 (0xB8) - J24	185 (0xB9) - J25	186 (0xBA) - J26	187 (0xBB) - J27
188 (0xBC) - J28	189 (0xBD) - J29	190 (0xBE) - J30	191 (0xBF) - J31
192 (0xC0) - L00	193 (0xC1) - L01	194 (0xC2) - L02	195 (0xC3) - L03
196 (0xC4) - L04	197 (0xC5) - L05	198 (0xC6) - L06	199 (0xC7) - L07
200 (0xC8) - L08	201 (0xC9) - L09	202 (0xCA) - L10	203 (0xCB) - L11
204 (0xCC) - L12	205 (0xCD) - L13	206 (0xCE) - L14	207 (0xCF) - L15
208 (0xD0) - L16	209 (0xD1) - L17	210 (0xD2) - L18	211 (0xD3) - L19
212 (0xD4) - L20	213 (0xD5) - L21	214 (0xD6) - L22	215 (0xD7) - L23
216 (0xD8) - L24	217 (0xD9) - L25	218 (0xDA) - L26	219 (0xDB) - L27
220 (0xDC) - L28	221 (0xDD) - L29	222 (0xDE) - L30	223 (0xDF) - L31
224 (0xE0) - P00	225 (0xE1) - P01	226 (0xE2) - P02	227 (0xE3) - P03
228 (0xE4) - P04	229 (0xE5) - P05	230 (0xE6) - P06	231 (0xE7) - P07
232 (0xE8) - P08	233 (0xE9) - P09	234 (0xEA) - P10	235 (0xEB) - P11
236 (0xEC) - P12	237 (0xED) - P13	238 (0xEE) - P14	239 (0xEF) - P15
240 (0xF0) - P16	241 (0xF1) - P17	242 (0xF2) - P18	243 (0xF3) - P19
244 (0xF4) - P20	245 (0xF5) - P21	246 (0xF6) - P22	247 (0xF7) - P23
248 (0xF8) - P24	249 (0xF9) - P25	250 (0xFA) - P26	251 (0xFB) - P27
252 (0xFC) - P28	253 (0xFD) - P29	254 (0xFE) - P30	255 (0xFF) - P31